

REMARKS

Reconsideration and allowance of this application are respectfully requested in light of the above amendments and the following remarks.

The Applicants acknowledge with appreciation the indication in the pending office action that claims 1, 2, 7 and 9 are allowed and claims 3, 6 and 10-15 would be allowed if amended to overcome the objections to claims 3, 6 and 10 in the section of the office action bridging pages two and three.

Claims 1-6, 8 and 10 have been amended to clarify the claimed invention and to place the claims in closer compliance with U.S. format, including overcoming the objections to claims 3, 6 and 10. Some of the amendments are broadening such as changing a "plurality of groove portions" to "at least one groove portion." In view of the comments in the office action, "die pad portion" has been changed to "die pad" throughout the claims. New claims 16-30 recite patentable features of the invention.

The objection to the title is traversed in that the title corresponds to the claim preambles. The present title is at least as descriptive as the U.S. patent documents that are of record in this application.

Proposed drawing corrections are submitted herewith to correct the cross-hatching in 1, 3, 5 and 6. Attached amended Fig. 6 has

been labeled as "prior art." Original Fig. 6 has not been labeled prior art because the Applicants note that not all of the subject matter of Fig. 6 is in the prior art. Specifically, the stepped portion of lead frame 1 of Fig. 6 is not prior art. Accordingly, this stepped portion has been removed from Fig. 6.

Turning now to the prior art rejections, claim 8 stands rejected under 35 USC 102(b) as anticipated by Morihiro (JP '946). Claims 4 and 5 stand rejected under 35 USC 103(a) as unpatentable over Morihiro in view of Kanji (JP '854). Insofar as these references may be applied against amended claims 4, 5 and 8, the Applicants respectfully traverse.

35 USC 102(b) Rejection of claim 8

The Office Action states that Morihiro shows a "die portion" 2 smaller in size than the chip 1. The Office Action asserts an interpretation of "die portion" as any portion smaller than the chip.

Amended claim 8 recites that "at least a portion of the outer periphery of the semiconductor chip extends outward from the outer periphery of said die pad."

Morihiro does not disclose such subject matter.

Thus, due to at least this subject matter, it is submitted that the 35 USC 102(b) rejection of claim 8 is overcome and should be withdrawn.

Rejection of Claims 4 and 5

Claims 4 and 5 now recite that the sealing resin contacts a bottom face of the semiconductor chip. This is supported by Figs. 1 and 2, in that in Fig. 2, it is clear that resin 15 contacts the bottom face of chip 12 since chip 12 extends beyond the extent of die pad portion 11.

Neither Morihiro or Kanji discloses or suggests such subject matter. Thus, it is submitted that, due to at least this recited feature, claims 4 and 5 patentably distinguish over Morihiro and Kanji whether considered alone or in combination.

For at least the above reasons, it is respectfully submitted that all grounds of rejection stated in the Office Action have been overcome. A Notice of Allowance is respectfully solicited.

If any issues remain which may be best resolved through a telephone communication, the Examiner is requested to kindly telephone the undersigned at the local, Washington D.C. telephone number listed below.

Respectfully submitted,

(see paper # 20)

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Exhibit I - Marked Up Claims

1. (Amended) A resin molded type semiconductor device comprising: a semiconductor chip which is mounted on a die pad [portion] of a lead frame; thin metal wires which electrically connect terminals of an upper face of said semiconductor chip to inner lead portions of the lead frame; a sealing resin which seals an outer peripheral region of said semiconductor chip, said region including a thin metal wire region of the upper face of said semiconductor chip, and a lower region of said die pad [portion]; and outer lead portions which are arranged in a bottom face region of said sealing resin, wherein said lead frame is subjected to an upsetting process so that said die pad [portion] is located at a position higher than said inner lead portions and at least a portion of the outer periphery of the semiconductor chip extends outward from the outer periphery of said die pad [portion is smaller in size than said semiconductor chip].

2. (Amended) A resin molded type semiconductor device comprising: a semiconductor chip which is mounted on a die pad [portion] of a lead frame; thin metal wires which electrically connect terminals of an upper face of said semiconductor chip to inner lead portions of said lead frame; a sealing resin which seals an outer peripheral region of said semiconductor chip, said region including a thin metal wire region of the upper face of said

semiconductor chip; and outer lead portions which are arranged in a bottom face region of said sealing resin and which are formed to be continuous to respective inner lead portions, wherein at least one groove portion is formed in a surface of each of said inner lead portions and at least a portion of the outer periphery of the semiconductor chip extends outward from the outer periphery of said die pad [portion is smaller in size than said semiconductor chip].

3. (Twice Amended) A resin molded type semiconductor device comprising: a semiconductor chip which is mounted on a die pad [portion] of a lead frame; thin metal wires which electrically connect terminals of an upper face of said semiconductor chip to inner lead portions of said lead frame; a sealing resin which seals an outer peripheral region of said semiconductor chip, said region including a thin metal wire region of the upper face of said semiconductor chip; and outer lead portions which are arranged in a bottom face region of said sealing resin and which are formed to be continuous to respective inner lead portions, wherein [a plurality of] at least one groove [portions are] portion is formed in a surface of each of said inner lead portions, a connecting portion of each of said thin metal [wire] wires is coupled to a respective [on a side of said] inner lead portion [is disposed between] at a flat surface region of said respective inner lead

portion adjacent said at least one groove [portions] portion [and
an area in a surface of said inner lead portion at which said thin
metal wire is contacted is flat].

4. (Amended) A resin molded type semiconductor device comprising: a semiconductor chip which is mounted on a die pad [portion] of a lead frame; thin metal wires which electrically connect terminals of an upper face of said semiconductor chip to inner lead portions of said lead frame; a sealing resin which seals an outer peripheral region of said semiconductor chip and which contacts a bottom face of said semiconductor chip, said region including a thin metal wire region of the upper face of said semiconductor chip; and outer lead portions which are arranged in a bottom face region of said sealing resin and which are formed to be continuous to respective inner lead portions [, and characterized in that said inner lead portions include a widened portion is formed in each of said inner lead portions].

5. (Amended) A resin molded type semiconductor device comprising: a semiconductor chip which is mounted on a die pad [portion] of a lead frame; thin metal wires which electrically connect terminals of an upper face of said semiconductor chip to inner lead portions of said lead frame; a sealing resin which seals an outer peripheral region of said semiconductor chip and which contacts a bottom face of said semiconductor chip, said region

including a thin metal wire region of the upper face of said semiconductor chip; and outer lead portions which are arranged in a bottom face region of said sealing resin and which are formed to be continuous to respective inner lead portions, [and characterized in that] wherein a widened portion is formed in each of said inner lead portions and at least one groove portion is formed in a surface of each of said inner lead portions.

6. A resin molded type semiconductor device comprising: a semiconductor chip which is mounted on a die pad [portion] of a lead frame; thin metal wires which electrically connect terminals of an upper face of said semiconductor chip to inner lead portions of said lead frame; a sealing resin which seals an outer peripheral region of said semiconductor chip, said region including a thin metal wire region of the upper face of said semiconductor chip; and outer lead portions which are arranged in a bottom face region of said sealing resin and which are formed to be continuous to respective inner lead portions, and [characterized in that] a widened portion is formed in each of said inner lead portions, [a plurality of groove portions] at least one groove portion is formed in a surface of each of said inner lead portions, [and] a connecting portion[s] of each of said thin metal wires [on a side of said] is coupled to a respective inner lead portion [are disposed between] at a surface region of said respective inner lead portion adjacent

said at least one groove portion[s].

8. (Twice Amended) A method of manufacturing a resin molded type semiconductor device, said method comprising the steps of: performing an upsetting process on a lead frame so that a die pad [portion] of said lead frame is located at a position higher than inner lead portions of said lead frame; bonding a semiconductor chip [which is larger in size than said die pad portion] to said die pad portion of said lead frame, wherein at least a portion of the outer periphery of the semiconductor chip extends outward from the outer periphery of said die pad; electrically connecting terminals of said semiconductor chip to said inner lead portions of said lead frame by thin metal wires; sealing an outer peripheral region of said semiconductor chip, thereby forming a sealing resin, said region including a region of an upper face of said semiconductor chip [and] that is electrically connected by said thin metal wires, and a lower region of said die pad portion; and shaping outer lead portions of the lead frame so as to be exposed from an outer face of said sealing resin.

10. (Amended) A method of manufacturing a resin molded type semiconductor device, said method comprising the steps of: bonding a semiconductor chip to a lead frame having inner lead portions in each of which a widened portion is disposed and [having a flat

surface in which a plurality of groove portions are formed] at least one groove portion is formed; electrically connecting terminals of said semiconductor chip to said inner lead portions of said lead frame by thin metal wires; sealing an outer peripheral region of said semiconductor chip, thereby forming a sealing resin, said region including a region of an upper face of said semiconductor chip and electrically connected by said thin metal wires, and a lower region of said semiconductor chip; and shaping outer lead portions of said lead frame so as to be exposed from an outer face of said sealing resin, and, when said terminals of said semiconductor chip are to be electrically connected to said inner lead portions by said thin metal wires, the connection is performed while connecting portions of said thin metal wires [on the side of said] are coupled to respective inner lead portions [are disposed in the flat surface between said plurality of groove portions] at a flat surface region of said respective inner lead portion adjacent at least one groove portion.